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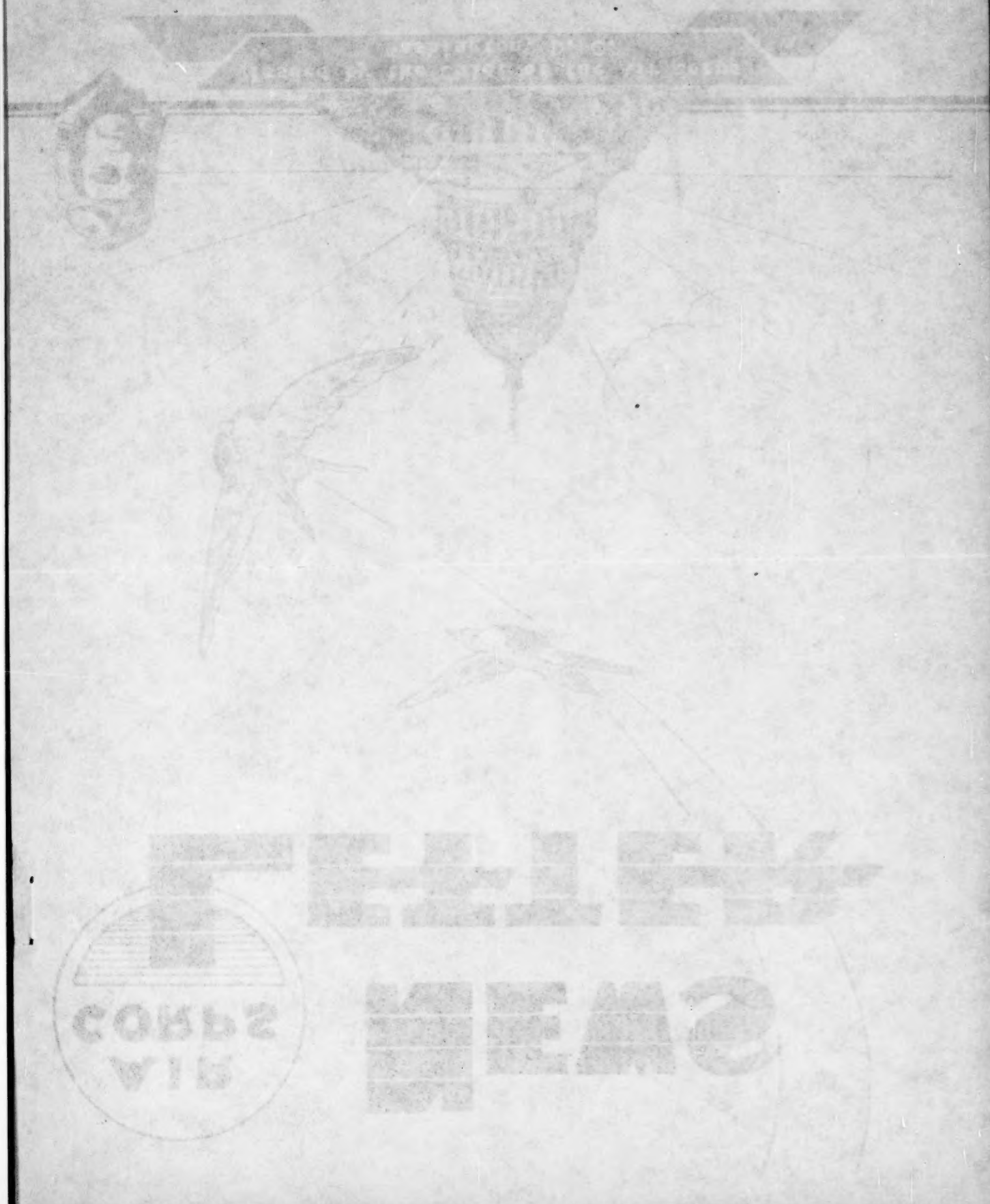

VOL. XIX **Air Corps News Letter** NO. 15

Information Division
Air Corps

August 1, 1936

Munitions Building
Washington, D.C.

The chief purpose of this publication is to distribute information on aeronautics to the flying personnel in the Regular Army, Reserve Corps, National Guard, and others connected with aviation.

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NEW SHORTCUTS IN BOMBARDMENT TRAINING

Eight thousand feet above a Southern California bombing and gunnery range, a twin-engined Bomber roars through the night. A mile nearer the earth another Bomber drops a flare, bathing the target in light more brilliant than day.....

Nearly two miles above March Field, a Bomber sets a course, and when the target appears in the bomb sight the bombardier releases not a bomb, but a radio signal .....

Embryo bombing pilots and bombardiers, sitting quietly indoors, drop theoretical explosives on a miniature range...

On the ground, carefully placed bombs riddle a retired Transport that the effect of bombing on airplanes in flight may be determined.....

Simple ideas involving the Hornet-powered Martin B-12 Bombers are bringing Bombardment units of the Air Corps a degree of training not possible a few years back. Coupled with the necessity for strict economy, these ideas are proving feasible in military operations.

Bombing with flares, for instance. Planes from the 19th Bombardment Group are now working out that technique. One, laden with 300-pound demolition bombs, flies at 8,000 feet. Another, bearing a load of parachute flares, flies at 2500. Their flights carefully timed, the flare ship passes over the target a few seconds ahead of the bombing ship. Carefully, pilot and bombardier figure speed and wind drift, release the flare. As the bombing plane further aloft roars on toward the target, the flare illuminates the objective, drifts slowly toward the center, and at the proper second the bombardier trips his releases, loosing the steel eggs for their flight toward the earth. Split-second accuracy is making this type of night bombing possible, even on nights when there is no natural light to assist.

The plan has further possibilities, Air Corps officers observe. Bombers flying at widely separated levels divide the anti-aircraft fire, thus rendering it less effective. Other ships laying smoke screens and gas further hamper ground troops. On moving targets, such as battleships, bombing, using flares, has not yet been tried. But officers concerned with the plan believe it will be similarly effective, once the speed and dirccion of the moving target is known.

Bombing with live bombs is very expensive, and for that reason an alternative method involving the "camera obscura" has been worked out. Here, as demonstrated by pictures taken at March Field, Calif., the bombardier presses his key to send a radio signal when the target appears at the proper spot in his bomb sight.

The camera obscura consists of a portable box, mounted on four wheels and pulled by a truck containing the necessary two-way radio apparatus. A lens in the roof of the box projects the image of the bomber on a large square of paper or chart. The chart room, no larger than four feet square, is light proof. In it the scorer traces the path of the plane and records the hits and misses.

Suppose we look in on such a flight. Radio truck and camera obscura, which comprise the camera or target station, take their position at the edge of the tarmack on March Field. Beyond the range of vision toward the southwest the Bomber climbs for altitude. At last the radio operator calls to the camera operator announcing the ship's course. You see the camera, which is set on an azimuth circle, swung about until the lens is inclined slightly toward the oncoming Bomber.

Were you aloft, you would hear above the droning engines the bombardier's voice as he speaks into the interphone system: "Steady on course. Turn right...steady... stop...right again.. stop...turn left... stop...", until finally the cross-hairs in the sight show the target centered way below and ahead. Then the bombardier "dumps his load," only now the load consists of a single radio impulse, and not a half-ton of TNT stuffed into a steel case at a cost of possibly $500. Having "fired," the plane continues its course, turns and again approcahes the target for another round.

Meanwhile, what's going on down below? Sitting in the radio truck, an operator facing his transmitting and receiving

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panel, a speaking unit at his mouth ready to talk with the bomber crew. Over the lone antenna stretching away from the truck to a sectional steel tower erected a few minutes earlier by two technical sergeants by the simple expedient of "walking it up," until the guywires were stretched taut, the signals flash. Standing at the camera obscura, head and shoulders hidden by the black curtain which had been rolled down to shut light out from the interior, one of the sergeants faced the drawing board down which the image of the plane is racing.

Through his earphones, the operator hears the "fire" signal. At that instant, the plane's image may be seen clearly at the top edge of the paper. After marking on the paper the point where the shadow fell when the radio shot was fired, the operator continues to chart the plane's path, marking at each second's tick of a metronome its new position. and 23 seconds after the signal was dispatched, he makes his final note. There is where the bomb landed.

Some little calculation is required for final results. Knowing the plane's altitude, the time of fall is likewise known. But the plane's speed also enters into the equation, and after these factors are applied the operators determine whether the "bomb" has struck the camera obscura, which was the target,or it was a miss; and if a miss, by how many feet. Simple when explained, and this method saves Uncle Sam thousands of dollars yearly. Or, to put it another way, makes possible one phase of repeated training in bombardment which otherwise would be impossible because of large costs involved in dropping the real thing.

Training with the camera obscura is not an occasional program. It continues for weeks, or until pilots and bombardiers become skilled in their teamwork. They then are ready to drop their annual allowance of 100-pound bombs for training and for record runs. Skilled though they may have become in "mock bombing," they still must actually drop live bombs to get the feel of bombing. Additional considerations come into play, such as air resistance to the bomb, coordinating the sight and release mechanisms and the actual mental reaction to dropping bombs containing explosives and seeing them strike the target on the nose.

In this phase of the program, the officers work by teams. Even yet the undertaking partakes of the synthetic,for only about four pounds of powder is loaded, the rest of the charge being made up of sand. Yet for all practical purposes, this constitutes "live" bombing, for the sand-filled projectiles behave exactly like powder-filled bombs and provide the necessary reality to the training.

Closely related to the work with the camera obscura is the training within a specially constructed room with the bomb sight. The pilot sits near the ceiling, Below him a device, known as a "miniature range," which is a small scale strip of terrain painted on a canvas, moves slowly on an endless chain. Below him, the bombardier sees bridges, railheads, farm houses, airdromes, highways, cities and ammunition dumps, moving along under him as though he were flying above this panoramic scene.

Suddenly he is ordered to bomb a given target - let's say, an ammunition dump. As the dump moves into line with the cross hairs of the sight, he turns a crank to set the instrument for ground speed,keeping the cross hairs lined up on the target until the automatic signal indicates that the mechanical plane is set. He pulls the release handle when the target crosses a second point on the sight. This movement operates a signal to the scorer, who notes the hit. It is only after intensive training on the indoor range that the pilots carry their lethal loads aloft for practice with live bombs.

Experiments related to defensive maneuvers in the air also have been conducted at March Field with obsolete airplanes. Small bombs were exploded in their vicinity and the effects on fuselage and wings were noted. While details of this undertaking are not available, it is expected to have an important bearing on defense maneuvers in the future, with particular consideration given to the position of planes in flight being made the target of time-fuse bombs dropped from higher flying elements.

Labor and money-saving devices put into effect by the Air Corps are saving many dollars for taxpayers and creating new standards of efficiency in bombing operations. Some of these ideas are almost childishly simple, yet they effect great savings. The innovations described above, and many others which have found practical operation in the Air Corps have been the outgrowth of practical progress in military aviation, coupled with the necessity for keeping the aerial units - both material and personnel - ready for action at the lowest possible cost.

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During the month of June, the Engineering Department of the San Antonio Air Depot overhauled a total of 22 airplanes and 82 engines and repaired 36 airplanes and 34 engines.

NICHOLS FIELD SCOOPS ITSELF DRY

By Lieut. Wycliffe E. Steele, Air Corps

Since 1924, the landing plat of Nichols Field, Rizal, P.I., has always changed to a veritable lagoon for several months each year during the rainy season, precluding any flying while the field was thus under water. The inundation became of such established yearly regularity that the field was humorously referred to as Lake Nichols.

It would seem that every year new plans were suggested for the diminution of or prevention of the floodings, but for one good reason or another they never reached the shoveling stage.

On October 15, 1935, Nichols Field, under the administration of Major Thomas W. Hastey, scooped the first shovel of dirt on a cardinal canal project that would forever keep the flying field drained to permit flying the year round.

The project as it was predetermined was no inconsiderable business, and, after examining the equipment available for the work, it seemed to us that the completion of the work would be long in coming. However, we had failed to reckon on the resourcefulness of the Air Corps.

When on May 27, 1936, the rains stepped in to put a stop to the task, 81 men, with the aid of a pigmy one-quarter yard gasoline shovel that required the ingenuity of the smart Air Corps maintenance crew to keep it in fighting trim for its prodigious gnawing labors, along with five tractors, rippers, scrapers, graders, twelve trucks, and ten thousand gallons of gasoline, had, in the one hundred and eighty working days since October, completed the big ditch to a point where the field was assured adequate drainage during this rainy season. It was a job well done.

From humble beginnings, Nichols Field's landing area has grown to a size of approximately 3850 feet long by 900 feet wide. This particular area was once the dozy barrio of Mabong. (Mabong had a scant sixty wells on its location which ranged in depths and peripheries up to sixty feet and thirty feet, respectively, to supply water for its bulo plants - "betel nut" - which require individual watering very frequently). The whole of this area is drained by the Paranaque River, which runs east to west along the north end of the field, and north to south along the west border of the post.

The Manila-Cavite railroad tracks run north and south along the east border of the landing field. East of the railroad, and rising to an average of approximately ten feet above the landing field, is a tract of land, some four thousand feet long and one thousand feet wide, given over to the cultivation of rice, a plant which requires water in capital letters. The flying field is a natural basin for the draining waters of this higher ground, a fact which guaranteed Nichols Field's annual flood.

The new drainage ditch, lying as it does between the Manila-Cavite Railroad tracks and the high rice land, gulps up every bit of water that tries to seep through unto the field from this area, and also takes care of about 75% of the field's drainage, emptying the whole into the Paranaque River.

A total of 65,000 cubic yards of dirt was dug out to make this ditch 3,600 feet long, 25 feet wide, with an average depth of five feet.

This canal by itself is of immeasurable value, but the building of it resulted in another improvement to the field almost as important as the drainage. The dirt that was dug out was used to build a monsoon runway, giving Nichols Field a good South West and North East landing run. Additional filling and leveling on the field resulted in a 700-foot increase in the length of the east-west landing run.

Approbation is due those officers and enlisted men who contributed to the successful undertaking of all this work and performed wonders with manifestly inadequate facilities.

Atop a human point of view, we reserve a special praise for those responsible for the direction of traffic during this work. The regular flying activities of the field were never hindered while those five tractors hitched to rippers, or scrapers, or graders, and those twelve trucks, heavily loaded or empty, shuttled back and forth over the field guided by wise traffic management. We are proud to state thatnot one accident occurred throughout the whole of this work.

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FIRST BALLOON SQUADRON IN MANEUVERS

The First Balloon Squadron is scheduled to depart from Fort Sill, Okla., on August 1st for Camp Custer, Mich., where they will engage in the Second Army Maneuvers for a period of two weeks, returning to Fort Sill upon completion of the maneuvers. The Squadron is to operate under simulated war conditions in all seriousness, since a limited amount of clothing is allowed and civilian clothing is entirely excluded.

The trip from Fort Sill is to be made by motor caravan, the entire unit moving by this means. The return trip is to be mate in the latter part of August.

THE NEW HOME OF THE 91ST OBSERVATION SQUADRON
By the News Letter Correspondent

CRISSY Field is no more.

No longer will the city by the Golden Gate enjoy the distinction of having an Army airport within its boundaries, or the residents thereof be awakened each morning by the sound of Army airplane engines humming over their rooftops.

No longer will the pilots of the 91st Observation Squadron returning from cross-country flights have to hope and pray that they will be able to find the field when they arrive, instead of a nice thick blanket of fog, concealing in its depths several assorted hills, bridge towers, high buildings, etc.

The 91st Observation Squadron and the 15th Photo Section, occupants of Crissy Field since its inception in 1919, were ordered away from their beloved home in the middle of June, and by the 30th of that month had packed, bag and baggage, families, household lares and penates, even to the Squadron dogs, and had moved over 900 miles to their new station, Fort Lewis, Washington.

The move was made by almost every conceivable means of transportation. Freight cars, passenger trains, government motor trucks, commercial motor vans, private cars, motorcycles and airplanes were all used in transporting the personnel and impedimenta of the field. The Squadron boat, with its caretaker, was loaded on a coastwise freight steamer and transported to Seattle, from which place it was run under its own power to Steilacoom, the nearest dock on Puget Sound at which it could be parked.

Although we had been prepared for the order to move for a month or more, no decision had been made as to the future home of the 91st, so no packing or crating was done until the final order to move was received. Upon the receipt of this order, all ordinary operations at Crissy Field were discontinued, and everybody was set to work completely stripping the field of movable Air Corps property, crating and boxing it, and loading it onto freight cars, of which a total of eight were fully loaded. The furniture of officers and noncommissioned officers was transported by commercial motor van, this being the most convenient and economical method.

Practically all the personnel of the post evacuated on or before June 27th, the only ones remaining after that date being those with property responsibility in order to turn over the property left behind to the Quartermaster, and to complete the audit of Air Corps Supply.

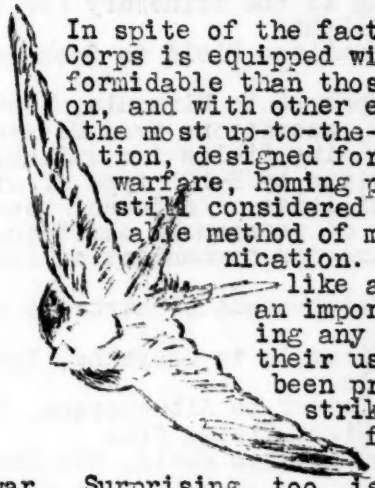
The Army motor truck convoy departed from Crissy Field at 8:00 a.m., June 27th, and consisted of two Field Servicing Trucks, two photographic trucks, two Federal 2½-ton cargo trucks, one reconnaissance car, three Dodge panel radio trucks, and a number of Dodge 1½-ton cargo trucks. Thirty-three enlisted men traveled with the motor convoy as drivers and relief drivers, accompanied by two officers as Convoy Officers. The convoy arrived at Fort Lewis, Washington, at 6:30 p.m., June 30th, having covered the entire journey in four days of driving. This is believed to be a record for moving an Army motor convoy. All driving was done by daylight, starts usually being made about 7:00 a.m., and halts for the night before 6:30 p.m. The longest day's drive was approximately 300 miles. Only one truck, one of the Field Servicing Trucks, gave any trouble during the entire trip. This vehicle suffered from vapor lock in the fuel line from the pump to the carburetor while driving through the Sacramento Valley in California on the first day out. The trouble was finally remedied by the ingenuity of the driver, who wrapped the line in asbestos packing, held on by friction tape, and removed the hood of the truck, after which it ran without further difficulty.

It speaks well for the quality and condition of the private automobiles owned by members of the command that, although nine officers and fifty-four enlisted men were authorized to proceed by privately owned automobile, all arrived at Fort Lewis safely, and not one report of mechanical trouble was heard - not even a punctured tire.

The airplanes assigned to the 91st Observation Squadron were all flown to Fort Lewis several days in advance of the final abandonment of Crissy Field, the C-14 Transport airplane making two trips to ferry the advance detail of enlisted men, and the C-14 airplane assigned to Hamilton Field was borrowed for two round trips to aid in ferrying this detail and to return the pilots of the O-25C airplanes to Crissy Field. A total of 25 enlisted men was transported by air.

The 91st Observation Squadron and 15th Photo Section, in their new home, Fort Lewis, are at present very badly handicapped by the lack of technical and administrative buildings. The buildings found here upon arrival were sufficiently large for the Air Corps Detachment of three officers, 35 enlisted men and three airplanes previously stationed here, but are totally inadequate for a full strength Observation squadron and photo section. Even with our few airplanes, half of them must be parked outside the hangar, and all departments have less than half the space required for efficient functioning. It is hoped that in the near future adequate housing will be provided.

THE TRAINING OF PIGEONS



In spite of the fact that the Air Corps is equipped with wings more formidable than those of the pigeon, and with other equipment of the most up-to-the-minute invention, designed for use in modern warfare, homing pigeons are still considered an indispensable method of military communication. The birds, like aviators, play an important part during any skirmish, and their usefulness has been pronounced by striking feats performed during both peace and war. Surprising, too, is the intelligence of these birds as exemplified when they arrive at their home loft, after encountering driving rains and heavy fog or an occasional battle with a pigeon hawk enroute. These adversities are rather insignificant compared with the hardships experienced in the last war. Some have completed their missions suffering from injuries so severe that they died after they arrived. This, it is said, is due to a more or less unsolved phenomenon in the fact that home to a pigeon is what the North is to a magnet. Too, it may seem strange to think that a pigeon has intelligence, but this faculty is one above all that the trainers depend upon most.

The pigeoneers at Bolling Field are steadily striving to increase this faculty. Under the supervision of Lieut. George W. McGregor, Air Corps; Staff Sgt. Gawthrop and Private Hagge, Signal Corps, a fine pigeon loft of sixty birds is kept and trained to the latest developments of pigeon usage. Usually the birds' training schedule is carried out when sufficient room is available in a transport plane to carry the basket in which they are kept prior to release. On some occasions the birds are released in flight. The motor of the plane is throttled back, and when the wind resistance is at its lowest degree the birds are tossed into the air. Here, again, the pigeon displays its intelligence, for it holds its wings closed until it has dropped sufficiently from the slipstream of the plane and then streads its wings to begin the homeward flight.

It is interesting to note that recently thirty birds were carried to Langley Field in an airplane, released, and 29 of them returned to Bolling Field. The first group arrived in four hours and forty mimutes, and arrivals continued for the next two hours. Poor weather conditions and fog along the course, with a strong prevailing northeast wind, made the flight difficult and, unfortunately, one bird was lost. Two days later, another flight of 24 birds was flown to Roanoke, Va., an airline distance of 200 miles. and released at 9:55 a.m. The first group of eight arrived at Bolling Field at 4:00 p.m., totalling 6 hours and 5 minutes' flying time. Ten more birds arrived at intervals that afternoon, and four birds arrived at intervals that evening. A little slow on schedule, four birds arrived the second day, one the third day and two on the fourth. The last arrival was completely exhausted, with a severe flesh wound in the breast but with every determination to fulfill its mission. Again, considerable fog and rain over the decidedly mountainous country made the flight a difficult one. Their flights were not listed as record flights, but their coming through under trying conditions well compensates for the time, patience and expense to preserve their usefulness in time of need.

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READY REFERENCE ON FLYING FIELDS

In order to facilitate and maintain a ready reference on the condition of all flying fields within a radius of 500 miles of Barksdale Field, strip maps covering ten routes radiating from that field have been mounted on panels which are hinged on a pedestal which is kept in the Post Operations Office. When changes occur on the condition of the flying fields shown on the strip maps, this information is posted on the margin of the panel opposite the field concerned. Pilots departing from Barksdale Field are able to secure information in a few minutes on all flying fields within a 500-mile radius by referring to these strip maps.

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UNFORTUNATE BALLOON ACCIDENT

Air Corps personnel offer deepest sympathy and condolences to the bereaved families of Master Sergeant R.F. Rumpel and Staff Sergeant D.T. Tucker of the First Balloon Squadron at Fort Sill, Okla. The two men met their death in the explosion and burning of a free balloon in which they were making a training flight.

Captain F.D. Lynch, who recently took over the command of the heavier-than-air unit at Fort Sill, was thrown clear of the debris and suffered from slight burns, while Staff Sergeant Joseph Murray, pilot of the balloon, was seriously burned and is now recovering in the station hospital. The balloon apparently exploded just as the rip cord was pulled when the basket touched the ground at the end of the flight about noon on July 10th.

Sergeant Rumpel was 46 years of age, and Sergeant Tucker, 33.

EXTENDED FLIGHT BY THE 11TH BOMBARDMENT SQUADRON

THE 11th Bombardment Squadron takes off from its base at Hamilton Field, Calif., at about 8:00 a.m., August 1st, on what promises to be an immensely interesting as well as instructive flight.

With nine B-10B airplanes awing, crewed by a total of 16 officers, 2 flying cadets and 18 enlisted men, the Squadron will parade its strength over one of the most interesting itineraries which has ensued from Hamilton Field for some time. Officers and men anticipate many pleasant visits to the cities and towns along the route, and it is hoped the flight will not only serve its basic purpose, instruction and training, but as a "Good Will Flight" as well.

The 11th Squadron possesses an enviable World War record, which includes honors for four battles (Lorraine, St. Mihiel and the Meuse-Argonne); 13 victories which received official recognition and confirmation; 32 bombing raids and 17 combats with 20 casualties, consisting of 10 killed, 8 taken prisoners, one wounded and one reported missing in action. Its peace-time record, which is second to none, includes selection as Bombardment Component of the Demonstration Unit at the Air Corps Maneuvers of 1931; commendation received from General MacArthur for loyal and efficiend work during those maneuvers; rescue of the snowbound Navajo Indians in Northern Arizona in January, 1932; a flight to the Yosemite Valley, via Death Valley, in May, 1932; the Rocky Mountain mission in November, 1932; assistance given to science in its quest for the secret of the cosmic ray undertaken by Dr. R.A. Millikan of the California Institute of Technology, and various other long cross-country flights too numerous to mention. It is morally certain the flight will reflect to the glory of this famous old organization, and the cities along their path will know that "Maggie" slipped again and that "Jiggs" is having a night out.

The 11th is now commanded by Major Carlyle H. Ridenour, Air Corps, who served with the Air Corps during the World War, graduated from the Air Corps Engineering School and earned a B.S. degree at the California Institute of Technology. The Squadron is particularly noted for its high altitude bombing work, having dropped bombs weighing from 100 to 2,000 pounds from record altitudes. Needless to say, such missions necessitate the use of oxygen and heavy winter clothing, whatever the weather conditions on the ground, and the rapid changing of temperatures from warm summer to coldest winter in the course of minutes causes considerable discomfort to all personnel participating.

The following is the itinerary for the contemplated flight:

August 1 - Hamilton Field to Spokane, Washington.

August 3 - Spokane to Missoula, Mont.

August 4 - 9, operations from Missoula to test all landing fields for suitability for operations by B-10B type of airplanes and facilities of adjacent towns for quartering of personnel, servicing of aircraft, and for communication facilities.

August 9 - Maintenance of aircraft at Missoula.

August 9 - Missoula to Cheyenne, Wyo., and Denver, Colo.

August 10 - Denver to Albuquerque, N.M.

August 11 - Night flying from Albuquerque to Hamilton Field, via March Field, Calif.

Following is the contemplated roster of personnel:

Officers

Major C. H. Ridenour, Commanding.
Captain D.R. Lyon, Operations Officer.
Captain M.L. Harding, Flight Commander.
1st Lt. H.T. Alness, Supply Officer.
2nd Lt. C.A. Peterson, Adjutant.
2nd Lt. A.R. Luedecke, School Officer.
2nd Lt. H.E. Knieriem, Assistant Communications Officer.
Flying Cadets Richard T. Knight and David H. Walker.

Enlisted Men

Staff Sergeants Charles W. Cheatham, Louis T. Silva, Everest F. Waid, Andrew R. Levesque.

Sergeants Ludwig Kurrle, Rua C. Hayes, Harold S. Cooper.

Corporals Otto G. Glass, Paul McDaniel, Raymond J. Elliott, Arthur R. O'Herron and Ira W. Huddleston.

Privates Roy J. Wilhite (1st Cl.), Gaston R. Upchurch, Thomas F. Dillon, John W. Taylor, Myron H. Pike, Leslie R. Brinkmeyer, James T. Phillips, Irving M. Camp, Robert M. Kinney, Jack E. Sullivan.

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DEMONSTRATION FOR WAR COLLEGE STUDENTS

The participation by the 37th Attack Squadron, Langley Field, in the demonstration for students of the War College left nothing to be desired in displaying effective tactics on deployed ground targets and convoy trains. Led by Major Schramm, Squadron Commander, graduate smoke eater of the last class of Chemical Warfare Service School, this unit strafed an area target with 2400 rounds of cal .30 ammunition, flying at 75 feet in echelon to the right. They added insult to injury by returning at 1000 feet and literally destroyed the target with sixty 25-lb. fragmentation bombs. To insure realistic conditions, the fragmentation bombs were serviced by the Nansemond Ordnance Depot on the James River and, judging by results, the time and expense were not wasted.

THE MEDICAL CONTRIBUTION TO THE DEVELOPMENT OF BLIND FLYING

By David A. Myers, Major, Medical Corps, U.S. Army.

(Continued from last issue)

In order to understand how and why this research was started, it is necessary to digress into aviation history.

From the beginning of man's invasion of the air, fog, the universal menace to travel of all kinds, has taken a great toll of human life. Old-time pilots learned to fly without artificial instrumental aids of any kind, and developed to a remarkable degree what was called "Flying Sense". Until long after the war, flying for any length of time without sight of earth or sky was impossible.

About 1918 Dr. Elmer Sperry of gyroscopic fame, invented a Turn indicator. Since that time many artificial aids to spatial orientation have appeared. Bank and Turn indicators, artificial horizons of various types, flight integrators, etc., all of these instruments are gyro controlled to overcome the pull of gravity and allow their "indicators" to show ship movement and spatial position.

The Sperry Artificial Horizon consists of a miniature gyro controlled airplane which will assume the position of the carrying plane while in flight. The pilot controls the position of his airplane by visualizing what the miniature plane is doing, and correcting his position accordingly.

The Bank and Turn indicator mounted at bottom has a pointing arrow which indicates all turns of the plane, and a small ball seen in the runway at the tip of the arrow, which moves from side to side when the plane is banked up in a turn to right or left. Every artificial aid to spatial orientation lets the pilot "mentally" keep one foot on the ground.

Probably one of the first pilots to become interested in the Turn indicator was Major William C. Ocker, Air Corps. It is believed he tested the original Turn indicator for Dr. Sperry, and, when the Bank and Turn instrument was brought out, was much enthused. The original intent of these instruments was to improve technical flying ability by showing pilots when smooth turns and banks were being made, and to function as a crutch to the magnetic compass. All of the old-timers were, however, taught to fly by instinct, and the terms "inherent flying ability", "seat sense" and "flying sense" came into use. Artificial aids showing them when their ships were turning or banking were considered as entirely useless, as all they had to do was to look at the earth and see what their plane was doing. So, although all planes were later equipped with indicators, they went unserviced and unused. Unfortunately for many, the visibility did not always stay good on every flight so that pilots could look overboard at God's horizon and see what their ships were doing. When visual contact with the earth was obliterated, they discovered that it was impossible to maintain their planes in the air. If the fog was not completely on the ground, they would come down under it and "hedge hop" over trees and houses in a desperate attempt to keep visual contact with the earth until they could find a place to land. Only extreme skill and good luck brought many of them through. If the fog was completely on the ground, the only alternative was to climb high above possible danger. This was little comfort, for there is the disturbing knowledge that when the ceiling is reached the fuel may be gone, and the plane must come down. Flying in fog without proper navigation instruments, the pilot will become hopelessly lost from a directional standpoint.

Flying in fog without a visual reference to gravity (the earth), such as a Bank and Turn indicator, or some form of artificial horizon, the pilot will be (1) unable to sense the position of his ship with relation to the earth's surface, (2) unable to sense the speed and direction of motion, and (3) will eventually go into circular motion, (4) experience the vertigo described, and (5) crash unless he takes to his chute before volitional control is lost.

Blind Flying is the grim specter of aviation. The remedy for all this is to practice simulated Blind Flying under the hood until Instrument Flying is as easy as flying under clear skies and with perfect visibility. About 1919, the Air Corps advocated the use of any instruments that would add to the safety of flying, and there was a revised interest in various flying instruments. However, no progress was made until 1926.

I quote from a report made by Donald E. Keyhoe in 1929:

"***Full credit must be given these men (pilots) who have tested the various instruments and methods suggested by scientists. The invention of the Bank and Turn indicator was the first step. But the pilots who first used it tried different methods without instruction, so few became expert. Those who succeeded were able to go through fog or snow for 20 or 30 minutes and at the end of that time their strained nerves would stand no more. Sight of ground or sky became vitally necessary to clear away the confusion that was swiftly taking control. Two men are mainly responsible for progress beyond this stage. Ocker and Myers proved that this strain was caused by the pilot's disbelief in his instruments and a strong tendency to trust his own

senses, which are always misleading. The Ocker-Myers method takes into account the three elements which give balance, muscle sense, sight and vestibular sense.***"

There is a tendency in an occasional young aviator to wax so cocky over his flying ability that it becomes necessary to partially deflate it for his own safety. For many years I had used the following plan in such cases: They were placed in the Jones-Barany revolving chair and turned right or left, and asked which way they were turning. Their replies were naturally correct. Their eyes were then covered and the rotation repeated. After a few turns, the chair was gently stopped and they were asked which direction they were turning. Vertigo having been induced, their replies were invariably that they had started to turn in the opposite direction of prior motion. The eyes were uncovered, and to their amazement the chair was not turning at all. If this did not quite satisfy them, the rotation was continued until they experienced the sensation that the body was not moving. On being uncovered and finding they actually were turning right or left, their chagrin was very evident. For an aviator to suddenly discover his inability to tell which way his body is turning, if at all, is, to say the least, disconcerting.

In January, 1926, I gave this induced vertigo test to Major Ocker - not because he was classed as cocky, but to see what the mental reactions of an old-time pilot would be when he discovered he could not tell whether he was turning or sitting still. Following the test, he disappeared without comment of any kind, but soon returned with a view box carried in his hand. The test was repeated in all combinations of rotation, using the unlighted box to cut out the light, and thus remove sight from the trinity of equilibrium senses. There was the usual induced vertigo, with the usual inability to tell correctly which way his body was turning, etc. The gyroscope was then started, and the Bank and Turn indicator put in action. The flash was lighted and the tests repeated. This time every answer was correct as to direction of motion, stopping and starting. Even the confusion of reversals was absent. The sensations were felt the same as before, but by giving the answer shown by the pointer on the Bank and Turn indicator, instead of the answer prompted by his senses, it was found impossible to confuse him.

This demonstration started the research into Blind Flying. It was immediately recognized that here was the answer to the pilots' inability to do Blind Flying without a visual reference to gravity.

By lighting the box, the equilibrium trinity of senses was restored to a coordinated action. Merely restoring sight to the equilibrium sense, however, is not enough. There must be something within the pilot's range of vision that will act as a vertigo stopper, and tell him what position his ship is in with relation to the earth. In other words, allow the pilot to mentally visualize "where is the ground". The hand on the Bank and Turn indicator will accurately show motion in either direction, right or left, and will come to a dead center and remain there when there is no rotation. There will be the same false impressions of reversal of movement and falling received by your brain, following the rotation, but by means of your sight you will be able to correct these false impressions of movement, and your vertigo will be almost immediately overcome, provided you believe the instrument.

That there was any connection between the normal physiological reactions of a pilot, and his lack of ability to do Blind Flying, had never occurred to either of us, until Major Ocker's experience with, and his absolute belief in, the action of the Bank and Turn indicator crashed head on into the author's knowledge of induced vertigo and the physiological reactions involved in the special senses concerned. Out of the wreck emerged several things of vital importance to aviation.

The foundation sense of all spatial orientation is vision. There is no substitute for visual reference. It makes no difference what the pilot sees so long as it gives him that vital information: "Where is the ground", and what is the position of the airplane with reference to it. Many accidents have resulted from ignorance of this vital principle. Many have resulted because there were pilots who knew they could do Blind Flying by using their "flying sense". There is no longer any excuse for ignorance regarding Blind Flying. Without exception the present-day pilot who can do so obtains training in instrument flying. This is a far different reaction than the general attitude of most aviators when Ocker and Myers announced, in 1926, that "No one could do Blind Flying without artificial aids", and that they "had discovered how to do it". We were both promptly labeled as being enthusiastically crazy.

In the past those pilots who had discovered they could not fly blind, did so through bitter experience. They, however, had nothing of value to report as an aid to their fellow pilots. They merely labeled themselves as better flyers than the average. However, it was noted they avoided fog flying. Having been taught to fly by instinct, it was hard to convince the average pilot that his flying sense would not bring him back from every flight.

A knowledge of the uses to which any

one of the special senses, the care of, and our reactions under all conditions, towards these special senses becomes of vital importance and value only to the individual making special and expert use of that special sense.

The airman being vitally concerned in his ability to sense his position, change of position and relation to the earth's surface has called all his special senses into play and has developed "FLYING SENSE". What is flying sense?

It is not an inherent sense.

It is an acquired sense.

It is something the airman has that others do not.

In its entirety it is composed of the special senses of: Sight - hearing - taste - smell - touch or tactile sense - muscle sense - vestibular or inner ear sense.

Just as there are degrees of "Doctor sense", there are airmen with varying degrees of "flying sense". Being an acquired sense and dependent for its development on the ability, adaptability, aptitude, and knowledge of the person, it is evident, that everything else being equal, the airman who correctly understands and interprets the sensations received from his various senses will have the most "flying sense".

Constant repetition of demonstrations with the Ocker-Myers "Vertigo Stopper Box" finally convinced pilots that it was a real lie detector, and that, on the ground at least, they could not tell which way they were turning, if they could not see. Many continued to fly by instinct in the stubborn belief that these "reverse" reactions could not happen in the air. In answer to this the author, with Major Ocker at the controls, spent some hours in the air as a "Blind Flying" observer, communicating by means of strings to tell him what I thought he was doing from time to time. Major Ocker also rigged up a covered cockpit ship with one exposed control pilot seat, and spent many hours testing out the various reactions of himself and others.

It was proven beyond a doubt that these reactions do take place in the air, and, in addition, are much intensified.

Later, our findings were communicated to the National Advisory Committee for Aeronautics, and elaborate flight tests were made with a covered hood and a control pilot. Their findings verified the theory that circular movement invariably resulted during flights made by a pilot flying in a totally dark cockpit. These findings verified our original contention regarding movement and the production of induced vertigo, and were made by Carroll & McAvoy. They published the following conclusions:

"Many pilots have felt that the flying sense was largely one of muscular balance and that visual reference played a more or less insignificant part. These experiments should serve to remove this idea and develop the appreciation of the fact that muscular balance plays an extremely small part in flying, excepting in correlation with visual reference in the development of a polished technique. Visual reference of some sort must be provided, either by the horizon, by the reflection of the sun or moon while in dense fog or clouds, or by proper instrumental equipment."

"The fact should not be neglected that the use of proper navigational instruments provides an artificial horizon, if not in a single instrument, then in the correlation of several instruments, such as a turn and bank indicator and an airspeed meter.

It can be recommended to all pilots that a careful self training in the use of and reliance on navigational instruments of this character will provide them not only with definite mechanical assistance, but likewise will go far to remove the psychological hazard of blind flying."

Professor Schaeffer, of the University of Kansas, many years ago conducted experiments with blindfolded individuals, and proved conclusively that spiral movement always resulted when running, walking, swimming, driving a car, etc. Continuing his experiments on the lower forms of life he came to the conclusion that any forward moving organism (including man) would move in a spiral path, provided no orientating sense, such as sight, touch, etc., guided it.

The value of the Ocker-Myers view box became generally recognized as the only means available of instructing pilots and prospective pilots while on the ground in the sensations they would experience and the reactions they would have if they attempted to do Blind Flying without an artificial horizon.

The term "Artificial Horizon" was originated by the author and given the following definition in the original report:

"Any instrument or combination of instruments that will quickly, easily and reliably give the pilot information that he may mentally visualize in terms of where is the ground."

In the United States Air Service magazine, issue of April, 1928, there appeared an article: "The Artificial Horizon Seeks Recognition", by Frederick R. Neely, in which the research conducted was fully explained.

Instrument Flying and Simulated Blind Flying were the logical outcome of this research work, because there had been established the physiological foundation on which to build the technical superstructure.

Major Ocker, visualizing that it was imperative every student at the Air

Corps Training Center should have this instruction, originated the demonstration box and formulated a course of ground instruction in Blind Flying, which was adopted by the Air Corps as routine in May, 1934. In addition, a routine course in actual Instrument Flying follows the ground instruction.

The Ocker-Myers demonstration box is based on sound physiological principles, and its value as a preliminary to actual Instrument Flying in an airplane is essential, because only in this way can the student be actually shown that he cannot depend on his own sensations when God's horizon is not available.

Myers and Ocker, having solved the problem of how to keep the pilot in the air when he did not have a horizon to look at, it became necessary to solve the problem of guiding him to his intended destination and safely landing him on an airport he could not see.

The development of blind take-off, blind navigation and blind landings was much stimulated by the discovery of the basic principles underlying Blind Flying. Today they are accomplished facts. Many familiar names are linked to this development: Doolittle, Hegenberger, Kingsford Smith, Lindbergh, Umstead, Griffin, etc.

The historical around-the-world flight, led by Captain Lowell H. Smith, Air Corps, was successful, because all of the pilots were strong advocates of Instrument Flying and expert in their use. This flight is all the more remarkable because at this time the research establishing the underlying principles had not been accomplished. They simply knew they had to depend on their instruments if they came through.

Many historical flights have been accomplished since that time, and without exception each and every pilot was an expert in Instrument Flying. These history-making flights include, among others, Lindbergh, New York to Paris; Post and Gatty, around the world; Mattern and Griffin, around the world; Herndon and Pangborn flight; Kingsford Smith, Trans-Pacific; Amelia Earhart, Trans-Atlantic and Pacific; Byrd, Transatlantic, North and South Poles; Lincoln Ellsworth, South Pole.

Recently Major Ira C. Eaker, Air Corps, flew from coast to coast, completely covered in a hooded cockpit - a wonderful example of not only Blind Flying, but of blind navigation.

Lt. Colonel Fitzgerald, who began his flying training in 1914, has continuously been an Instrument Flying enthusiast to the extent that he frequently adopts this method and gets under the hood in perfectly clear weather in order to protect himself from the sun's rays.

While there were many other pilots who paid particular heed to Instrument Flying in the old days, the examples cited are mentioned for the purpose of showing that if this type of flying is participated in for a length of time, sufficient to train the pilot in automatic control, he will finally become as proficient as if he were flying in ideal weather. Colonel Fitzgerald states he did not know why he used instruments when the weather was soupy - he only knew he had to if he survived.

The successful blind flier must correlate his senses to his instruments.

To Major Ocker belongs the credit of supplying the original problem for solution and the development and application of the technical aids essential to that solution. His unlimited experience and unflagging interest was a constant stimulation. His development of the Ocker course of ground instruction, now in universal use, shows he has unlimited vision regarding aviation.

To the author belongs the credit of conducting the medical research that resulted in the discovery of the basic underlying principles now universally acknowledged as the solution of the difficulties encountered in Blind Flying, and thus furnishing the basis on which all present-day Instrument Flying is based.

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MERCY FLIGHTS BY KELLY FIELD AMBULANCE

On July 15th, a plane piloted by Lieut. Ken Rogers, with Sergeant S. Birkland as mechanic and Corporal R.C. Cheek as hospital attendant, went to Dallas, Texas, to pick up a soldier from Battery F, 15th Field Artillery, a member of the Texas Centennial Battalion. This man had an acute case of appendicitis, and the Transport C-15 hospital ship returned him to the Fort Sam Houston Hospital.

The same ship took off at 2:25 p.m. for San Diego, Texas, with Captain Donald Olds as pilot, Staff Sergeant F.K.McKowan as crew chief, and Captain B.R. Galbraith, Medical Reserve, attached to CCC component, as medical attendant, to pick up a CCC youth, named Eleno Guerra, who was injured in an auto truck accident and was suffering from a compound fracture of one leg. The injured youth was at the CCC camp at Alice, Texas, but there was no field in the vicinity listed as suitable for the Transport. Accordingly, the Post Operations Officer, Major U.G. Jones, went to Alice in a basic training plane looking for a suitable landing place, and the only one he found was a straight strip on the new concrete highway to Alice. After landing there, he made arrangements with the CCC officials to move the injured youth to the landing field at San Diego. Here he was picked up by the Transport plane and brought to the base hospital at Fort Sam Houston. The Transport landed at Kelly Field at 6:15 p.m.

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Special Orders of the War Department announce the appointment of Capt. Bob E. Nowland to the temporary rank of Major, Air Corps, with rank from June 16, 1936.

IMPRESSIONS OF THE FLEDGLINGS

By 1st Lieut. R. T. Coiner, Jr.
Graduate of Class No. 25-B, March-June, 1936.
Transferred to Air Corps from Cavalry; member of Class, United States Military Academy, 1932.

It is far from easy for such recent members of the winged brotherhood to write coherently on the subject of our initiation. The feeling of relief and of joy at finally having completed the course completely supersedes at times any other feelings or impressions that we may have had. We are intensely proud of having been able to go through the school and are proud also of the happiness in our success and good wishes of our brother officers in the branches of which we were so recently members.

One of the most outstanding impressions gained at the school is the universal desire of all officers to make the new arrival like the Air Corps. We found this to be universally true and, although after a bad day we sometimes felt that our instructors regretted our presence bitterly, a good day in the air changed their minds, we hope - and most certainly changed ours. The eagerness of its personnel to have other people like their branch, and not only to like it but to want to be a part of it, is a wonderful heritage; and now that we are members of the Air Corps we hope that we, in our turn, may do our part towards making our branch well liked.

The intense desire to succeed manifested by the students, and the equally intense desire to have the student succeed manifested by the instructor, is quite noticeable. The student-instructor team, fostering between them this will to succeed in their task, are laying an invaluable foundation for the success of the Air Corps in peace and in war. Any unit in the defense of the nation, whose personnel have as the basis of their military careers the desire to attain the objective developed to such a degree as it is developed in the school, is fortunate, indeed.

Those of us who managed to survive the rigors of the training year cannot help but feel that those who were less fortunate and did not survive have gained much in experience of a military nature that will be of inestimable value to them in the years to come. They cannot help but have a greater sympathy for the Air Corps and its problems, and in carrying this feeling out to the line of the Army they are doing a great and lasting good. They have served in the line, and in going back to the line after their experience in the school, however limited, they quite naturally have the foundation of fact on which to base their comparisons and arguments.

Having served from one to three years in the line, we hope that any experience we have gained in that service is going to make our service in the Air Corps more valuable to the government which has educated us. It is rather awe inspiring to realize what an investment we represent, and on sober consideration and reflection it makes us hope that we in our time may do as much as those before us have done to keep the Air Corps in the same high position that it holds now.

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NEW LIGHTING SYSTEM AT KELLY FIELD

Kelly Field's new night lighting system is rapidly being installed, augmenting the present system by an installation of three Type 9-A floodlights, one of which is installed at the west end of the northwest-southeast runway, which is intended to be the primary runway if and when the new installations are developed on Kelly Field. Another replaces the old floodlight at the southwest edge of the field, and the third replaces the old floodlight in front of the present Post Operations Office. In addition to this, there is a new T which has automatic wind control settings, and a new system of signal lights for night flying control with its necessary cabinet controls located in the night flying control tower and Post Operations Office.

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88TH OBS. SQDN. CELEBRATES REORGANIZATION

The 88th Observation Squadron, Hamilton Field, Calif., was first organized in 1917. It was discontinued after the World War, but in June, 1928, it was reorganized at Fort Sill, Oklahoma. The Squadron celebrated its reorganization on July 3rd at McNear's Beach, Calif. All duties were suspended for the day, and everyone adjourned to the beach early in the forenoon.

Swimming, soft ball, and a fat man's race added to the general gaiety and entertainment. Private "Bing" Carter easily showed his heels to the others in the fat man's race, so that the real rivalry in this event was between Sergeant Sweeney and Private Gardner for second place.

In the first of the two soft ball games, the enlisted men "hit their stride" early in the game and very definitely trounced the officers' team. In the second game, however, the officers started to click and the tables were turned. Too tired to play off the tie, the decision is still a "draw".

Ample refreshments were provided.

V-7067, A.C.

RECORD BOMBING BY 7TH BOMBARDMENT GROUP

Results of the record bombing conducted by the 7th Bombardment Group, Hamilton Field, Calif., in accordance with TR 440-40, dated March 11, 1929, show that, of the 69 individuals participating who actually fired the course, 66, or 94.6%, exceeded the qualifying score of 1500. Of the three who failed to attain the qualifying score, two did not complete the record bombing.

In this record bombing, the highest score was achieved by two officers of the 31st Bombardment Squadron, each with 1974. Of the 66 participants of the Group who qualified, 28 made scores above 1900; 30 above 1800; 6 above 1700 and 2 above 1600. The 11th and 31st Squadrons qualified 100%. In the 11th, the highest score recorded was 1957 and the lowest 1820. The general average for this squadron, with 25 firing the course, was 1820. In the 31st, with 16 firing the course, there was only one score below 1800, and that was 1790. With 11 scoring above 1900 and four above 1800, the general average for this squadron was 1919.8.

In the 9th Bombardment Squadron, with 25 out of 28 qualifying, the average score of all personnel completing the record bombing was 1823.

All of the bombing practice was conducted at Mather Field, Calif. These squadrons conducted the record bombing training in accordance with TR 440-40, March 11, 1929, by authority of the Commanding General of the GHQ Air Force, in order to secure uniformity of training in all squadrons of the 7th Bombardment Group. These regulations provide for the dropping of 10 bombs from 5,000 feet and 10 bombs from 8,000 feet for record scoring. The total possible score for bombing is 2,000 points. Only the rating of Expert Aerial Bomber is provided for, and the qualifying score is 1500.

Bombing training is now being conducted by the 7th Bombardment Group in accordance with tentative TR 440-40, dated November 26, 1935.

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GENERAL ANDREWS VISITS SELFRIDGE FIELD

Major-General Frank M. Andrews, Commander of the GHQ Air Force, accompanied by Major George C. Kenney, Air Corps, a member of his staff, landed at Selfridge Field at 9:00 p.m., Monday, July 13th, in the new XC-32 Douglas Transport which has aroused widespread commend among aviation enthusiasts. It is equipped with complete office facilities. On July 14th, the General witnessed the climbing test to 20,000 feet of a squadron of P-26's and a squadron of PB-2A's with full military load. This test was for the purpose of comparing the climbing time of each type of airplane. Both officers departed in the afternoon of that day.

HIGH ALTITUDE BOMBING BY 9TH BOMB. SQDN.

The 9th Bombardment Squadron, Hamilton Field, Calif., has just completed a period of high altitude bombing at Mather Field, Calif., during which time a total of 496 bombs were dropped from an altitude exceeding 10,000 feet. The ground temperature averaged 90 deg. F. or above, and was the cause of much discomfort, as the flying personnel had to don heavy flying suits for protection against the freezing temperatures aloft.

This was the first extensive bombing done by this squadron at the high altitude, and much information was derived therefrom. The Martin Bombers were loaded with nine practice bombs, which were dropped individually in nine successive trips over the target. This necessitated remaining at the bombing altitude for over an hour, and enabled the pilots to gain experience in maneuvering the airplanes at high altitudes for a considerable length of time. All pilots found that flying the precise and accurate courses necessary to bombing at this altitude and at the same time using the microphone and inhaling oxygen was very fatiguing. The bombardiers, too, found that manipulating the bomb sight and related controls called for a lot more exertion than at the lower altitudes. Upon return to the ground, those participating in these flights became drowsy and lethargic, and the fatigue appeared to be out of proportion to the time flown. However, as the flying personnel became more accustomed to and proficient at operating at this altitude, the missions became less fatiguing.

It was found that any errors in sighting or releasing the bombswere considerably magnified by the time the bombs reached the ground. Especially was this true of bombs which started their fall as wobblers. Although the scores have not been fully analyzed, it is believed that they determined many of the variables of high altitude bombing.

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FLYING TIME OF 91ST OBSERVATION SQUADRON

During the training year 1936, the 91st Observation, now stationed at Fort Lewis, Wash., with a daily average of seven airplanes in commission, amassed a total of 5,398 aircraft hours. The largest amount of flying done in any one month was in March, when 604 hours were registered, and the least was during February when, due to very bad weather conditions, only 302 hours were flown. In cooperation with other branches of the military service, a total of 542 hours was flown, and a total of 331 hours of night flying was accumulated between foggy nights at Crissy Field, Presidio of San Francisco, Calif.

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The contribution of material from Mitchel Field, N.Y., and Wheeler Field, T.H., will be greatly appreciated.

V-7067, A.C.

OLD PLANE DESTROYED BY MACHINE GUN FIRE

Airplane #29-226, which served as a transport for the 3rd Attack Group, Barksdale Field, La., for the past few years, was recently destroyed by machine gun fire. The airplane had outlived its usefulness and had been pronounced unsafe for flying. Permission was secured from the Materiel Division to dispose of the plane in this manner, in order that the effectiveness of raking machine gun fire against an area target and against light material might be determined.

Each fuel tank of the airplane contained approximately 60 gallons of gasoline, and the engines were started and left turning up at 1,000 rpm while three missions were fired. When approximately 100 rounds from each gun had been fired upon the third mission, fire was seen to break out in front of the left motor, spreading rapidly until the ship was a mass of twisted and molten metal. The results of the firing, which had been observed from dugouts made for this occasion, led to the following conclusions:

1. That an area seventy yards wide is a proper target for a three-ship element; that the length of such area depends upon the speed of the airplane and the capabilities of the gun.
2. That sweeping fire over an area is effective against material within the area.
3. That machine gun fire is an effective agent against airplanes on the ground and will immobilize an outfit until all airplanes can be carefully inspected for damage to interior structures.

It is an interesting fact that Staff Sergeant Young, who was the first crew chief on this airplane when it came to the Group seven years ago, was also the last crew chief, and it was he who started the engines for this last time.

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MITCHELL AIR RACE SET FOR OCTOBER 17TH.

Lieut. Colonel Ralph Royce, commanding Selfridge Field, Mich., recently selected October 17th as the date for the running of the Mitchell Trophy Race at Selfridge Field. It is stated that greater speeds are expected to be attained this year, as the First Pursuit Group is now equipped with the new Consolidated PB-2's.

Last year, the winner of this contest, the late Captain Karl G.E. Gimmler, piloting a Boeing P-26A Pursuit plane, averaged 212.6 miles per hour over the 100-mile course. There were ten Air Corps pilots in the competition.

A crowd of approximately 40,000 witnessed the event, which was held under ideal weather conditions.

NAVIGATION SCHOOL AT HAMILTON FIELD

The 7th Bombardment Group's Navigation School is now well under way at Hamilton Field, Calif., under the able instruction of 1st Lieuts. Walter R. Agee and Richard C. Lindsay, Air Corps. The course has been improved and extended to include celestial navigation.

A new class, consisting of 1st Lieuts. Edward W. Suarez (Headquarters); George D. Campbell, Jr., (88th Squadron); Wm. W. Garland (70th Service Squadron), and 2nd Lieut. Paul C. Ashworth (11th Squadron), was started July 6th, with Lieut. Agee as instructor. In addition to the intricacies of drift meters, course and distance computers, and the preliminaries of the "seven flyings,"* the members of the new class have been getting transition on the Douglas OA-4B's and doing water landings at Clear Lake in anticipation of the work which will soon be conducted over the waters of the Pacific.

Another new feature of the Navigation School is the course in Meteorology under the instruction of 1st Lieut. H.H. Bassett, Air Corps, who recently joined the forces at Hamilton Field after spending the past year studying Meteorology at the California Institute of Technology.

A practical application of navigation is to be made shortly, when the 7th Bombardment Group, in collaboration with the 19th Group from March Field, intercepting a ship off the coast near Los Angeles, will simulate a night bombing attack.

* 1. Simple Flying; 2. Traverse Flying; 3. Parallel Flying; 4. Middle-Latitude Flying; 5. Mercator Flying; 6. Great Circle Flying; 7. Composite Flying.

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POST FIELD NOT SO HOT, EH WHAT?

Talking about the weather, the News Letter Correspondent at Fort Sill, Okla., remarks that Post Field proved to be a great disappointment to its residents. They remarked it as the hottest place in existence Then the newspaper gave the temperature of nearby towns as 120 degrees, thus shoving our residents' claim as a "first" down to a poor second with only 113 degrees. They aren't in the cellar position, anyway, and according to the old timers in these parts July is not bad compared with August - so help us.

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The 35th Pursuit Squadron, Langley Field, celebrated its Organization Day on June 25th with an outing at Yorktown Beach, Va. With chicken and barbecue and liquid refreshments, appetites were thoroughly satisfied. In the afternoon a soft ball game between the personnel of 8th Pursuit Group Hqrs. and the 35th Pursuit was morally won by the last named outfit, as Headquarters tired about the 12th or 13th inning and gave up.

V-7067, A.C.

B I O G R A P H I E S

COLONEL ROY C. KIRTLAND

Colonel Roy C. Kirtland, Air Corps, who was recently detailed for duty in the Inspector General's Department, Washington, D.C., was born at Fort Benton, Montana, May 14, 1874, and was educated in the public schools of Denver, Colo., and Washington, D.C.

Enlisting in the Army on November 8, 1898, he saw service as Private, Corporal and Sergeant, Company M, and Battalion Sergeant Major, 7th Infantry, to August 29, 1901. He was then commissioned a second lieutenant of Infantry and served continuously with this branch of the service until March, 1911, in the meantime being promoted to 1st Lieutenant, May 18, 1905.

Colonel Kirtland is one of the early Army pilots, receiving in 1911 Certificate No. 45 from the Federation Aeronautique Internationale. He also holds Expert Aviator License No. 11 from the Aero Club of America. From April to June, 1911, he was in charge of the U.S. Aviation School at College Park, Md. Later he was on duty as assistant flying instructor. He commanded the 1st Aero Squadron from June to November, 1913, and served as Adjutant, Supply Officer, Disbursing Officer and Quartermaster of the Signal Corps Aviation School at San Diego, Calif., from December, 1913, to April, 1915. He then returned to the Infantry, but rejoined the Aviation Section, Signal Corps, during the War, reporting for duty at Kelly Field, Texas, on October 2, 1917. He was commissioned Major (temporary), Aviation Section, Signal Corps, September 22, 1917. Several days later he was assigned to the command of Taliaferro Field, Fort Worth, Texas, but, due to the exigencies of the service, his duty at that field was of brief duration,for in November, 1917, he was placed on duty with Col. Chalmers G. Hall in connection with organizing four regiments of specially selected mechanics, known as the 1st, 2nd, 3rd and 4th Motor Mechanics Regiments, subsequently redesignated as Air Service Mechanics, and was largely instrumental in solving all problems of efficient organization for these regiments and in the selection of the commissioned personnel therefor. Subsequently he was sent to Camp Hancock, Ga., to take charge of organizing of the regiments at the mobilization camp, and from the beginning of the organization in Deeember, 1917, until the entire four regiments were completely organized, he was commanding officer of the Air Service camp at Camp Hancock and in charge of all matters affecting the organization of the four regiments mentioned. During this time he had under his command up to approximately 12,000 men, all recruits with little or no experience. He was subsequently in command of the 3rd Regiment in France and exercised the functions of regimental commander throughout a period of over six months. Among his other duties overseas were that of inspector of aviation activities in England and commander of the Air Service Rest Camp in that country.

On October 24, 1918, he reported for duty at the Army Line School at Langres, France. Shortly following his return to the United States in January, 1919, he was assigned to the command of the Aviation General Supply Depot at Middletown, Pa. He was relieved from the Air Service in October, 1919, and was attached to the 17th Infantry at Camp Meade, Md., until February 20, 1920, when he was again detailed to the Air Service and assigned to the command of Rockwell Field and the Aviation Supply and Repair Depot at that post.

On August 30, 1920, Colonel Kirtland reported for duty as student at the Army School of the Line at Fort Leavenworth, Kansas. Following his graduation in June, 1921, he continued on duty at Fort Leavenworth as student at the General Staff School until his graduation therefrom on June 23, 1922. Thereafter,until August, 1925, he was Instructor at the General Service Schools at Fort Leavenworth. Following a year of duty as student at the Army War College at Washington, D.C., he was, upon his graduation in June, 1926, detailed for duty as a member of the War Department General Staff, Washington, D.C.

Following the completion of his four-year detail with the General Staff, Col. Kirtland, in July, 1930, was assigned as Commanding Officer of the 2nd Wing, Air Corps, and of Langley Field, Va., also as Acting Commandant of the Air Corps Tactical School. In July, 1932, he was assigned to duty as Air Officer of the 2nd Corps Area, Governors Island, N.Y., and occupied this position until April, 1935, when he was assigned as Air Officer of the 9th Corps Area at the Presidio of San Francisco, Calif. This duty terminated on July 18, 1936, to enable him to take over his new assignment in the Inspector General's Department.

Colonel Kirtland holds the ratings of Airolane Pilot and Airplane Observer. In the early days of the Air Corps he held the ratings of Military Aviator and Junior Military Aviator.

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LIEUT. COLONEL HENRY C.K. MUHLENBERG

Lieut.-Colonel C.K. Muhlenberg, Air Corps, now on duty as Air Officer of the

3rd Corps Area, Baltimore, Md., was born in St. Louis, Mo., November 6,1886, Upon his graduation from the United States Military Academy and being commissioned a second lieutenant on February 14, 1908, he was assigned to the 14th Infantry. Five months later he was transferred to the 30th Infantry, and he served with this organization at Fort William McKinley, P.I., to July 14, 1909, and thereafter at the Presidio of Monterey, Calif., to March, 1911, and on the Mexican Border at San Diego, Calif., to June, 1911.

Detailed to the Ordnance Department on June 20, 1911, Colonel Muhlenberg was on duty at Frankford Arsenal, Pa., as Assistant to the Officer in Charge of Small Arms Ammunition Department for two years; at the Watertown, Mass., Arsenal for one year as a student, and at the Springfield, Mass., Armory during the last year of his four-year detail. From August, 1915, to October, 1917, he served with the 2nd Infantry at Fort Shafter, T.H., following which he was detailed to the Aviation Section, Signal Corps, and assigned to station at Rockwell Field, Calif., to undergo flying training. While at this station he commanded the 14th Aero Squadron. In May, 1918, he was transferred to Wilbur Wright Field, Fairfield, Ohio, and placed in charge of the Testing Department, Technical Section.

From September 13, 1918, to January 8, 1919, Colonel Muhlenberg was commanding officer of the Armorers' School at Wilbur Wright Field. He was then assigned to the Engineering Division at McCook Field, Dayton, Ohio, as Chief of the Material Department. On May 18. 1920, he reported for duty at Rich Field, Waco, Texas, as commanding officer and, after serving in this capacity for several months, he was assigned as Assistant Professor of Military Science and Tactics at the University of Washington, Seattle, and placed in charge of the Air Service R.O.T.C. unit thereat. During the course of his service at the University of Washington, he commanded in the summer vacation periods R.O.T.C. camps at various localities; in 1921 at Post Field, Fort Sill, Okla.; in 1922 at Mather Field, Mills, Calif.; in 1925 at Rockwell Field, Calif.; in 1926 at Vancouver Barracks, Wash., and at the camp in 1928 at the Presidio of San Francisco, Calif., he was Executive Officer. In July, 1927, he assumed the additional duty as commanding officer of the Air Corps Reserves at Sand Point Airdrome, Wash.

Relieved from duty at the University of Washington on January 23, 1929, Col. Muhlenberg was assigned as Air Officer of the 5th Corps Area at Fort Hayes, Columbus, Ohio. On September 1, 1933, he began the one-year course of instruction at the Air Corps Tactical School at Maxwell Field, Ala., and, upon graduation therefrom in June, 1934, he was stationed at Bolling Field, D.C., as commanding officer until January 15, 1935, when he was assigned to his present duty as Air Officer of the 3rd Corps Area.

Colonel Muhlenberg was promoted to 1st Lieutenant, June 6, 1914; to Captain, March 11, 1917; to Major, Signal Corps (temporary), October 23, 1917; to Lieut. Colonel, Air Service (temporary), August 20, 1918; to Major, Air Service, July 1, 1920, and to Lieutenant Colonel, Air Corps, January 28, 1932. He received his rating as Junior Military Aviator on March 16, 1918, which rating was subsequently changed to that of Airplane Pilot.

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72ND PERSONNEL INSPECT LANDING FIELDS

A flight of five Bombers, led by Major I.H. Edwards, commanding officer of the 72nd Bombardment Squadron, Luke Field, T.H., recently departed from that field to make the rounds of all the landing fields on the other islands. The first stop was the Lanai City Airport. Hilo was the next point visited, and the officers and men spent the night at the Kilauea Military Camp. On the following day, landings were made on the fields at South Cape, Upolu Point, Hana and Maalaea, the flight remaining at the last named locality for the night.

Three planes took off the next morning at 6:00 o'clock to enable the personnel to take a look at the sun coming up over the top of Haleakala - a very beautiful sight, indeed. After these planes returned to Maalaea, the flight took off for Kalaupapa (Leper Colony), Homestead and then home. While at Homestead, a truck was rented to take all the personnel to Kaunakakai to meet its unusual mayor, but that individual could not be found. The flight arrived at Luke Field at 12:30 p.m., June 11th.

The 72nd, accompanied by the Observation Squadrons of Luke Field, took off on June 29th for Kauai, landing at Lihue Dairy Field and at Burns Field. All the emergency landing fields on Kauai and Niihau were inspected from the air. The flight remained at Burns Field for the night and returned to Luke Field the following day.

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37TH ATTACK TAKES OVER 19TH AIRSHIP HANGAR

The 37th Attack Squadron is now well established in the former 19th Airship hangar at Langley Field, Va. Operations are being carried on from the small landing area near the hangar. Facilities are being made available which should make the new location adaptable to very efficient operations. The 37th was notified that their first A-17 Attack plane would be ready for delivery before August 1st.

COL. TINKER TESTS NEW BLIND FLYING HOOD

On the morning of July 7th, Colonel C L. Tinker, commanding officer of Hamilton Field, Calif., cleared that station for March Field in his Martin B-10B Bomber for the purpose of service testing a blind-flying hood, which had been designed by the 19th Bombardment Group and which had been adapted to the B-10B with minor alterations by the 7th Bombardment Group.

After attaining altitude over Hamilton Field, Col. Tinker closed himself under the hood and began his instrument flight over the commercial airline route to Los Angeles. Over San Francisco Bay, he picked up the Oakland radio beam. Approximately 45 minutes later, the Fresno beam was intercepted and flown until the Los Angeles beam became audible. After an elapsed time of 2 hours and 15 minutes, the plane was over Burbank. Here the flight by instrument was interrupted, due to the fact that the March Field beam was not in operation, and the flight was completed by dead reckoning.

At 1:50 p.m., Colonel Tinker cleared March Field for the return flight to Hamilton Field. Upon intercepting the Fresno radio beam, he again closed himself under the hood, and flew by instruments to Oakland. The flight completed, it was ascertained that approximately four hours had been spent under the hood, and a distance of over 600 miles had been covered. Weather conditions were excellent, but the air being unusually rough it made flying very difficult.

This flight demonstrated the feasibility of instrument flying training for military personnel in tactical airplanes. It clearly showed that Bombardment Aviation can and will be able to move out under the most adverse weather conditions. Thorough training in instrument flying will be accomplished by the 7th Bombardment Group in its tactical airplanes, and will no longer have to depend on its one BT for instrument flying training.

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PROMOTION OF AIR CORPS OFFICERS

The following Air Corps officers who held temporary increased were promoted to regular rank as of the dates indicated:

To Colonel: Col. (temp.) John D. Reardan, July 1, 1936.

To Lieutenant-Colonel: Lieut. Colonels (temporary) Joseph T. McNarney, June 26; Edwin B. Lyon, June 29; Hume Peabody, July 1; Earl L. Naiden, July 13.

To Major: Major (temp.) Lowell H. Smith, June 26, 1936.

Lieut. Colonel Glenn I. Jones, Medical Corps, formerly Chief of the Medical Section, Office of the Chief of the Air Corps, was placed on the retired list with the rank of Colonel, July 31,1936, for disability incident to the service.

FLIGHTS BY THE THIRD WING

Personnel and airplanes of the Third Wing, Barksdale Field, La., were engaged in several interesting missions during the month of June. Perhaps the one which was not only the most interesting but attracted much attention to the Air Corps was a flight of 36 airplanes, composed of 19 Pursuit and 17 Attack airplanes, which staged an aerial exhibition on June 6th at the official opening of the Texas Centennial at Dallas, Texas. The flight, in command of Lieut. Colonel Millard F. Harmon, performed acrobatics and an attack upon ground targets during the afternoon. At night, maneuvers with searchlight batteries from Fort Crockett were executed and several flares dropped, after which an interesting feature was provided those present when "Texas 1936" was spelled through the use of huge six-foot letters. These had been designed and made especially for this purpose by cutting the letters and numbers from wood, wiring in many small bulbs, and attaching them to the bomb racks of the Attack airplanes.

Sunday was spent by the pilots and mechanics in wandering through the Centennial grounds, to which they had been admitted on passes through the courtesy of the Centennial Commission. Sight-seeing busses were available for those who became foot weary.

The flight returned to Barksdale Field Monday morning after congratulations were bestowed upon officers, flying cadets and enlisted men who had worked diligently in order that the mission might be a success. They feel that credit has not only been reflected upon the Third Wing, but upon the Army Air Corps as a whole.

During the time the flight remained at Dallas, operations were made from Hensley Field, where a temporary base had been set up by members of the 60th and 71st Service Squadrons, in charge of Major Roy W. Camblin, Air Corps.

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NEW LIGHTING FACILITIES AT BROOKS FIELD

New airdrome equipment is being installed at Brooks Field, Texas, under the direction of the Construction Quartermaster. A tower for a remotely controlled wind indicator is placed in front of the transient hangar, and a bank of B-9 floodlights are being placed at the northeast end of the field and one bank at the west end of the field. It will be quite some time yet before these lights will be used, as the airdrome is still torn up incident to the construction of the new runways.

Practically all of the commissioned personnel at Brooks Field will participate in the Command Post Exercises of the 3rd Army, which will commence about August 15th and last for about a month.

COOPERATIVE MISSIONS BY 3D ATTACK GROUP

The 3rd Attack Group, Barksdale Field, La., performed two cooperative missions during the month of June, the first being flown by the 90th Attack Squadron and the other by the 13th Attack Squadron.

The 90th Squadron dispatched a flight of three A-12 airplanes to Maxwell Field, Ala., from where they were to operate in an attack on ground troops in the vicinity of Fort Benning, Ga., on June 17th. After the attack, which was highly successful by the use of machine guns (simulated) and mustard gas (actual lime water sprayed from two 18-gallon tanks on each plane, loaded at Maxwell Field), the flight landed at Lawson Field, Fort Benning, for a brief conference, then took off for Maxwell Field where they spent the night, returning to Barksdale Field the following day. The flight was participated in by Lieuts. George McCoy (Flight Commander), James L. Daniel and Harvey P. Huglin, pilots, and Sergeant Otis Paris, Corporal Waldo J. Bither and Private Herbert E. Thompson, mechanics.

On June 20th, three A-17 airplanes of the 13th Squadron, piloted by Lieuts. Paul D. Bunker, Jr., W.H. Wise and R.A. Livingstone, with Tech. Sergeant G.W. Mitchell, Staff Sergeant K.A. Huber and Corporal H.V. Hardy as crew chiefs, took off from Barksdale Field for Fort Sill, Okla., where they were joined by three O-43 airplanes from Brooks Field, Texas. These airplanes became the "Red Air Force" in GF Ex. #8 of the graduating class at the Field Artillery School.

During the first two days of the exercise, which opened on the morning of June 22nd, the Red Force repulsed the "Blues" with the use of simulated machine gun and bombing attacks against mall bodies of troops. However, the Blues, after falling back to a fortified position, turned the Reds back in retreat for the remainder of the problem.

The Attack flight was somewhat handicapped in trying to lay a simulated mustard gas barrage when they were forced to use FM smoke instead of the usual lime water spray. Prevailing high winds soon dispersed attempts by pilots to lay the simulated gas, but otherwise the mission was very successful.

The Observation flight proved very effective in locating the rapidly moving targets of the motorized units. Members of the flight were impressed with the way ground troops are absorbing the principles of speedy concealment during air attacks. The horse-drawn outfits were remarkable in their rapid withdrawal from the roads into the trees, bushes or other available cover.

Upon completion of the problem, the Attack flight laid a demonstration smoke screen which met with the approval of all officers present. The flight returned to Barksdale Field on the afternoon of June 26th, and those who participated in the mission agreed that it had been of great instructive value and that, except for the extreme heat, the stay at Fort Sill had been very pleasant.

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THIRD TRANSPORT SQUADRON HAS ANNIVERSARY

The first anniversary of the organization of the 3rd Transport Squadron at the San Antonio Air Depot, Duncan Field, Texas, fell on July 5th. The celebration of the first Organization Day was postponed to July 8th, when a delightful outing was enjoyed amid the groves and by the streams of beautiful Landa Park at New Braunfels, near San Antonio. Attending were Major J.P. Richter, the first commander of the Squadron, and Mrs. Richter; Captain E.D. Perrin, present Squadron Commander, and Mrs. Perrin, and all the enlisted men and their families and guests, to the number of about forty.

Swimming, boating and fishing, with ample refreshments and a general good time, went to make the occasion a great success. The Squadron has reason to look back on its record, as a young organization, with pride and encouragement. The Provisional Squadron was established at the San Antonio Air Depot in February, 1933, with one enlisted man (pilot), to which two were added later, all on detached service from other stations; and continued as such until the organization of the 3rd Transport Squadron as an active unit, July 5, 1935.

Since the beginning of this transport service, down to the end of the organization's first year, a period of 41 months, 312,900 transport miles have been flown, comprising 1223 flights, with a total of 249 passengers carried, 841,000 pounds of freight delivered to other stations, and 518,500 pounds of freight flown in to the Depot. Three planes were employed 15 months, two 18 months, and one the remaining 6 months.

During this first year of the Squadron's organization as an active unit, 351 transport trips were made, with a total of 120 passengers carried, 232,500 pounds of freight delivered to other stations, 170,000 pounds of freight flown in to the Depot, and total mileage flown 96,100. The cost of operation during this period was $12,800. The authorized enlisted strength of the Squadron has recently been increased from 25 to 35, its present strength being 29, including four enlisted pilots.

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Major Edward C. Black is relieved from duty at Langley Field, Va., and assigned to Hamilton Field, Calif., next October.

LONG AERIAL JAUNT FOR 31ST BOMB. SQUADRON

On August 2nd, the 31st Bombardment Squadron, in conjunction with other squadrons of the 7th Bombardment Group, will leave Hamilton Field, Calif., on what promises to be one of the most interesting flights the squadron has ever undertaken. The plans call for a squadron flight to Boise, Idaho, via Reno, Nevada, where the Squadron will operate for about a week, conducting daily flights throughout the region in order to obtain the necessary detailed information relative to facilities available in that area for the accommodation of air units.

While a complete schedule for the flight has not been made, tentative plans call for this Squadron to make the trip with eight of the new B-10B bi-motored Martin Bombardment aircraft. These airplanes are the latest type of Bombers, with a wing spread of 70 feet. They are truly the modern dreadnaughts of the air. Each plane carries a crew of four; the pilot, bomber and gunner, radio operator, and a rear gunner. The plans call for 14 officers, 2 flying cadets and 16 enlisted men to make the trip.

The 31st is one of the oldest squadrons in the Air Corps. It was originally organized as the 31st Aero Squadron at Kelly Field, Tex., in 1917. Soon after its organization, the Squadron proceeded to Issoudun, France, the great Allied training center for airmen. Here its present insignia, the "skull and crossbones," was adopted. The Squadron was on active duty in France from August 22, 1917, to April 4, 1919.

The 31st Aero Squadron was demobilized on April 14, 1919, at Camp Mills, Long Island, but was reconstituted as the 31st Bombardment Squadron on the inactive list on March 24, 1923. On April 1, 1931, it was reorganized and became an active unit of the 7th Bombardment Group at March Field, Calif. In December 1934, the 7th Bombardment Group, including the 31st Bombardment Squadron, moved to Hamilton Field, San Rafael, Calif., where it is now stationed.

Major Harold D. Smith, the Commanding Officer of the 31st Squadron, who saw service during the World War, began his career as a cadet at the ground school at Cornell University. He was commissioned a second lieutenant in the Aviation Section, Signal Corps, April 24, 1918, after completing his flying training at Ellington Field, Houston, Texas. He later completed courses at Langley Field, Va., Taliaferro Field, Texas, and Clermond Ferrand, France. In August, 1918, he was assigned to the 136th Aero Squadron as a Bombardment pilot. The Squadron operated with the First Army, and was a portion of the First Day Bombardment Group. Major Smith wears two bronze stars on his World War ribbon for front line service in two major engagements. After the Armistice he flew in Germany as part of the Army of Occupation. He has been on duty at various Air Corps stations since the War, and has been commanding officer of the 31st Squadron since January, 1934.

Officers and men of the 31st Squadron are

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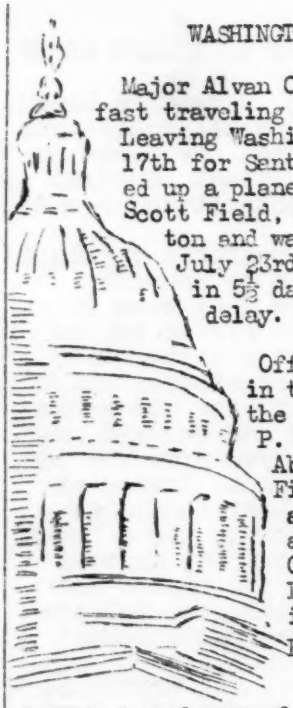
WASHINGTON OFFICE NOTES



Major Alvan C. Kincaid performed some fast traveling about both by air and rail. Leaving Washington at 5:30 p.m., July 17th for Santa Monica, Calif., he picked up a plane there, ferried it to Scott Field, took a train for Washington and was back in the office on July 23rd. The trip was completed in 5½ days, including one day's delay.

Officers reporting for duty in the Office of the Chief of the Air Corps were Major Chas. P. Prime and Captain Evers Abbey, both from Mitchel Field, N.Y. Major Prime was assigned to the War Plans and Training Division and Captain Abbey to the Supply Division. Both had served in the Chief's office on a previous occasion.

Colonel Alfred H.Hobley departed on leave of absence on July 15th. Major David S. Seaton returned from leave on July 26th and Captain James C. Cluck on July 18th.

Lieut. Colonel William E. Lynd and Captain M.E. Gross returned from navigation flights to Wright Field. Major Charles Y. Banfill also returned from a navigation flight.

Visitors to the Office of the Chief of the Air Corps recently during the course of navigation flights, or for other purposes, were Brig. General James E. Chaney, Commanding the Air Corps Training Center, Randolph Field, Texas; Lieut. Colonel Carl Spatz, Major Lawrence P. Hickey and Captain Edwin R. McReynolds from Langley Field, Va.; Major Alfred J. Lyon from Maxwell Field, Ala.; 1st Lieuts. T.B.McDonald from Middletown, Pa., Air Depot, and W.P.Sloan from Barksdale Field, La.

Lieut. Colonel Arnold N. Krogstad, Commanding Officer of Kelly Field, Texas, reported on July 21st for temporary duty in the Chief's Office.

Captain R.V. Laughlin left for Wright Field on July 21st.

Major John I. Moore reported from Maxwell Field for duty at the Army Industrial College on July 25th.

31st Bombardment Squadron
Continued from first column

looking forward to this trip, and expect that each day will bring forth new and varied experiences. As a number of cities and airports will be visited daily, this Squadron anticipates a week of interesting events and incidents during its visit to the Northwest.

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